

Reg. No

Name

17P105

MSc DEGREE END SEMESTER EXAMINATION- NOVEMBER 2017
SEMESTER 1 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY
COURSE : 16P1CHET01 / 16P1CPHT01 - INORGANIC CHEMISTRY - I
(Common for Regular - 2017 / Supplementary - 2016 Admissions)

Time : Three Hours

Max. Marks: 75

Section A
Answer any 10 (2 marks each)

1. What are ionization counters?
2. How many alpha and beta particles are emitted in Thorium series?
3. What were the expectations of Fermi when he bombarded uranium compounds with slow neutrons?
4. Which is the major photosynthetic pigment in plants? Give its structure.
5. Simple heme units cannot act as oxygen carriers. Why?
6. Give the structural features and function of Ferritin.
7. Why Co-based macrocyclic complex is well suited for radical-based rearrangements rather than Fe-complex like haem?
8. Give a schematic representation of synergic bonding in metal carbonyls.
9. What is Vaska's compound? It undergoes addition reaction with H₂ readily. Why?
10. Comment on the stability of potassium pentacyanocobaltate(II) complex
11. Differentiate between insertion and extrusion reactions with suitable examples.
12. What is platinum POP? Give its structure.
13. Write a suitable mechanism for the following transformation.



(2 x 10 = 20)

Section B
Answer any 5 (5 marks each)

14. Explain about the different techniques used in nuclear waste management.
15. Explain the technique Neutron activation analysis based on radioactivity.
16. Briefly explain the mode of transport and storage of iron in living organism.
17. Discuss the mechanism of action of cis-platin as anti cancer drug.
18. Calculate the TEC, PEC and predict the structures of
a) Ru₅(CO)₁₆C b) [Os₅(CO)₁₅]²⁻

19. *Explain the bonding in π -metal olefins.*
20. Write a note on substitution reactions in organometallic complexes. Differentiate between associative and dissociative substitution reactions.
21. Write a note on fluxionality. How NMR spectroscopy is useful to study the fluxionality in compounds with acyclic alkenes.

(5 x 5 = 25)

Section C

Answer any 2 (15 marks each)

22. Explain in detail the different modes of radioactive decay by giving suitable examples.
23. Briefly discuss the important functions and mechanism of action of
a. Vitamin B₁₂. b. Cytochrome P₄₅₀ c. Carbonic anhydrase. (5 × 3 = 15 marks)
24. What are LNCCs and HNCCs? Discuss the polyhedral skeletal electron pair approach (Mingos's rules). Find out the total electron count, polyhedral electron count and predict the structures of [Os₅(CO)₁₅]²⁻ and Ru₅C(CO)₁₆.
25. Explain the mechanism of Wacker process using catalytic cycle. Mention its rate expression and give evidences for the mechanism.

(15 x 2 = 30)